CLAIMS

1. Device for the signal processing in a hearing aid, comprising a filter for the frequency-dependent amplitude adaptation of an input signal and means for the adaptation of coefficients of this filter in accordance with the input signal, wherein the device comprises
a means for determining coefficients of a compression amplification g_m, which coefficients describe a frequency-dependent adaptation of the input signal in accordance with frequency-dependent signal levels x_n of the input signal,
a means for determining coefficients of a noise suppression a_m, which coefficients describe a frequency-dependent adaptation of the input signal in accordance with interference noises detected in the input signal,
wherein the means for the adaptation of coefficients of the filter establishes these coefficients from the coefficients of the compression amplification g_m and the coefficients of the noise suppression a_m.

2. Device in accordance with claim 1, wherein the means for determining coefficients of the compression amplification g_m comprises a means for determining signal levels p_n in a first number of frequency ranges F_n with n=1..N of the input signal and a means for determining the coefficients g_m for the compression amplification for each one of a second number of frequency ranges Φ_m with m=1..M of the input signal as function of an optionally modified signal level p_n assigned to the frequency range Φ_m.

3. Device according to claim 2, wherein the means for determining signal levels p_n forms these iteratively as momentary effective values of a signal power in the corresponding frequency range F_n.

4. Device in accordance with claim 1, wherein the means for determining coefficients of the noise suppression a_m comprises means for determining modulation depths d_m in a second number of frequency ranges Φ_m with m=1..M of the input signal and a means for determining the coefficients a_m for the noise suppression for each of the frequency ranges Φ_m of the input signal in accordance with the corresponding modulation depths d_m.

5. Device according to claim 2, wherein $N < M$ applies and at least one of the frequency ranges F_n for the compression amplification comprises at least two of the frequency ranges Φ_m for the noise suppression.

6. Device in accordance with claim 5, wherein the signal processing for the compression amplification is designed to determine each coefficient g_m for the compression amplification respectively as $g_m = f_m(p_n)$, wherein p_n is the optionally modified signal level of that frequency range F_n for the compression amplification which comprises the frequency range Φ_m for the noise suppression, and f_m is one of M functions, which in their totality determine a frequency-dependent compression amplification.

7. Device according to claim 6, wherein the coefficients a_m und g_m being combined with one another are logarithmically scaled and their combination by subtraction forms a combined logarithmic amplification value $c_m = g_m - a_m$.

8. Device in accordance with claim 1, wherein the means for the adaptation of coefficients of the filter is designed to adapt not all, but only selected coefficients at predefined time intervals.

9. Device in accordance with claim 1, comprising means for the correction of the compression amplification by modification of the signal levels p_n in accordance with the noise suppression.

10. Method for the signal processing in a hearing aid, in which coefficients of a filter for the frequency-dependent amplitude adaptation of an input signal are adapted in accordance with this input signal, wherein the method comprises the following steps:
    - Determining coefficients of a compression amplification g_m, which describe a frequency-dependent adaptation of the input signal in accordance with frequency-dependent signal levels of the input signal,
    - determining coefficients of a noise suppression a_m, which describe a frequency-dependent adaptation of the input signal in accordance with interfering noises detected in the input signal, and
    - the calculation of the coefficients of the filter out of the coefficients of the compression amplification g_m and the coefficients a_m of the noise suppression.

11. Method according to claim 10, wherein for determining coefficients of the compression amplification g_m in a first number of frequency ranges F_n respectively assigned signal levels p_n with n=1..N of the input signal are determined, and the coefficients of the compression amplification g_m for each one of a second number of frequency ranges Φ_m with m=1..M of the input signal are determined as function of a signal level p_n assigned to the frequency range Φ_m.

12. Method in accordance with claim 11, wherein a signal level p_n is iteratively calculated respectively as momentary effective value of a signal power in the corresponding frequency range F_n.

13. Method according to claim 10, wherein for determining coefficients of the noise suppression a_m in a second number of frequency ranges Φ_m with m=1..M of the input signal modulation depths d_m are determined and the coefficients a_m are determined for each one of the frequency ranges Φ_m in accordance with the corresponding modulation depth d_m, wherein the modulation depths d_m are determined from a time-dependent sequence of maximum values and minimum values of a signal level p_m in the respective frequency range Φ_m, and the signal level p_m is formed in a in a frequency range Φ_m as effective value of the signal power in the corresponding frequency range Φ_m.

14. Method in accordance with claim 13, wherein for every modulation depth d_m, which exceeds a predefined value, the assigned coefficient a_m is zero, and for values of the modulation depth d_m below the predefined value, the coefficient a_m increases monotonically with declining modulation depth d_m.

15. Method in accordance with claim 10, wherein at least one of the frequency ranges F_n for the compression amplification comprises at least two of the frequency ranges Φ_m for the noise suppression, and every coefficient g_m for the compression amplification is determined respectively as $g_m = f_m(p_n)$, wherein p_n is the signal level of that frequency range F_n for the compression amplification, which comprises the frequency range Φ_m for the noise suppression, and f_m is one of M functions, which in their totality determine a frequency-independent compression amplification, and wherein the coefficients a_m and g_m are logarithmically scaled and their combination by subtraction forms a combined logarithmic amplification value $c_m = g_m - a_m$.

16. Method in accordance with claim 10, wherein the coefficients of the filter are updated at regular time intervals, wherein, however, during each updating not

all, but only a few of the coefficients updated, in particular only those coefficients, the changes of which are the greatest or exceed a predefined value.

17. Method according to claim 16, wherein the combined coefficients of the filter (6) c_m in the filter (6) are transformed into linear values γ_m and an iterative, frequency-specific updating of a transmission function of the filter in accordance with $H(z)[k] = H(z)[k-1] + \Sigma_m (\gamma_m[k] - \gamma_m[\kappa_m]) \cdot H_m(z)$ takes place, wherein $H_m(z)$ only in the frequency range Φ_m comprises a pass characteristic and otherwise a blocking characteristic, κ_m designates a sampling interval, in which the transmission function for the frequency range Φ_m has been updated the last time, and a Summation Σ_m in a sampling interval k respectively only comprises one or some few of the overall M frequency ranges.

18. Method in accordance with claim 10, wherein the step of determining coefficients of the compression amplification g_m takes into consideration the values of the coefficients of the noise suppression a_m.

19. Method in accordance with claim 18, wherein the coefficients of the compression amplification are determined from modified signal levels p_n' instead of the signal levels p_n, wherein $p_n' = p_n - r_n$ applies, and r_n are logarithmically scaled correction values, which correspond to a signal attenuation caused by the noise suppression.

20. A hearing aid, comprising means for the implementation of the method in accordance with claim 10.